CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/CEMENT/2014-15

Date: 04.09.2014

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
*AGENCY	:	**Technical Manager (West),** KRIDL, Bangalore.
*NAME OF THE WORK	:	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
*REFERENCE	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
SAMPLE ID	:	Cement (Sample 1)
SAMPLE RECEIVED ON	:	02.09.2014
PERIOD OF TESTING	:	02.09.2014 to 04.09.2014

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	145 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	490 Minutes	Not More than 600 Minutes
2	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.00 %	-
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/SAND-Gradation/2014-15 : 04.09.2014

TEST REPORT ON DETERMINATION GRADATION OF FINE AGGREGATES (SAND)

*** Customer** : **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.

*** Agency** : **Technical Manager (West),** KRIDL, Bangalore.

*** Name of Work** : Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.

Reference : BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014

Technical Reference : IS : 2386 Part 1 - 1963 RA-2007

Sample ID : Fine Aggregates (Sand) (Sample 1)

Sample Received on : 02.09.2014

Date of Testing : 04.09.2014

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)			
		Zone-I	Zone-II	Zone-III	Zone-IV
10	100	0	0	100	100
4.75	91.80	90-100	90-100	90-100	95-100
2.36	81.28	60-95	75-100	85-100	95-100
1.18	53.38	30-70	55-90	75-100	90-100
600 Micron	33.15	15-34	35-59	60-79	80-100
300 Micron	17.45	5-20	8-30	12-40	15-50
150 Micron	2.15	0-10	0-10	0-10	0-15

* Information is furnished by the Customer/Representative

Remarks : This sample is under Zone-I specific limits.

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T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/AGG/GR/2014-15 : 04.09.2014

TEST REPORT ON COARSE AGGREGATES

*** Customer**	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
*** Agency**	: **Technical Manager (West),** KRIDL, Bangalore.
*** Name of Work**	: Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (40mm) (Sample 1)
Sample Received on	: 02.09.2014
Date of Testing	: 04.09.2014

Total Wt. of Aggregates in gms= **10000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS 383-1970 (RA- 2007)	
		Graded	Single Sized
80	100	100	-
63	100	-	100
40	90.04	95-100	85-100
20	16.53	30-70	0-20
10	3.01	10-35	0-5
4.75	2.46	0-5	-

* Information is furnished by the Customer/Representative

Remarks : This sample is under Single Siged specific limits.

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T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/AGG/GR/2014-15 : 04.09.2014

TEST REPORT ON COARSE AGGREGATES

* Customer	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager (West),** KRIDL, Bangalore.
* Name of Work	: Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
* Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Technical Reference	: IS : 2386 Part 1 -1963 RA-2007
Sample ID	: Coarse Aggregates (20mm) (Sample 1)
Sample Received on	: 02.09.2014
Date of Testing	: 04.09.2014

Total Wt. of Aggregates in gms= **5000**

Is Sieve Size in mm	Cumulative Weight Passing in %	Specific Limits as per IS :383-1970 (RA- 2007)	
		Graded	Single Sized
40	100	100	100
20	96.10	95-100	85-100
10	27.06	25-55	0-20
4.75	7.16	0-10	0-5

* Information is furnished by the Customer/Representative

Remarks : This sample is under Graded specific limits

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CIVIL-TECH CONSULTANTS AND ENGINEERS

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NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.14/KRIDL/STEEL/2014-15 06.09.2014

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	:	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Reference	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Date of Test	:	06.09.2014
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	8	0.40	510	552	13.05	O.K	O.K

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Job No.: CTCE/BBMP/W.No.14/KRIDL/STEEL/2014-15 06.09.2014

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	:	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Reference	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Date of Test	:	06.09.2014
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	10	0.58	513	556	13.35	O.K	O.K

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Job No.: CTCE/BBMP/W.No.14/KRIDL/STEEL/2014-15 06.09.2014

TEST REPORT ON REINFORCEMENT STEEL

Customer	:	**Asst. Executive Engineer**, T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	:	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Reference	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Date of Test	:	06.09.2014
Technical Reference	:	IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	12	0.89	515	558	13.60	O.K	O.K

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T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/CUBE/2014-15 08.10.2014

TEST REPORT ON DETERMINATION OF COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager (West),** KRIDL, Bangalore.
* Name of the work	: Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
* Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day
Sample Received on	: 07.10.2014

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	10.09.2014	08.10.2014	8.146	478.3	21.26
2	10.09.2014	08.10.2014	8.239	489.6	21.76
2	10.09.2014	08.10.2014	8.396	510.4	22.68

* Information is furnished by the Customer/Representative

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T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/CUBE/2014-15 11.10.2014

TEST REPORT ON DETERMINATION OF COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager (West),** KRIDL, Bangalore.
* Name of the work	: Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
* Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28th day
Sample Received on	: 07.10.2014

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	13.09.2014	11.10.2014	8.436	531.4	23.62
2	13.09.2014	11.10.2014	8.377	510.6	22.69
2	13.09.2014	11.10.2014	8.255	482.3	21.44

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Job No.: CTCE/BBMP/W.No.14/KRIDL/Pre slab/2014-15

22.09.2014

PRE CAST SLAB(CORE) TEST REPORT

Name of Customer	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Name of Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of work	:	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Referece	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
No.of Sample Tested	:	03
Date of Testing	:	22.09.2014
Techinical Reference	:	IS:516-1959 (Reaffirmed 2008), SP-24:1983.
Grade of Concrete	:	M_{15}

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	77.00	0.380	2513.41	1.54	0.955	25.10	12.78	13.81	13.18	16.48
2	50.00	78.00	0.388	2533.42	1.56	0.960	25.90	13.19	14.25	13.68	17.10
3	50.00	79.00	0.395	2546.48	1.58	0.965	26.45	13.47	14.55	14.04	17.55

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CIVIL-TECH CONSULTANTS AND ENGINEERS

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Job No.: CTCE/BBMP/W.No.14/KRIDL/WMM/Gradation/2014-15 25.09.2014

GRADATION FOR WMM

MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of Work : Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.

Reference : BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014

Date of Testing : 25.09.2014

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **25990**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	995	995	3.8	96.2	95-100
22.4	5490	6485	25.0	75.0	60-80
11.2	5625	12110	46.6	53.4	40-60
4.75	4030	16140	62.1	37.9	25-40
2.36	3840	19980	76.9	23.1	15-30
0.600	3010	22990	88.5	11.5	8-22
0.075	2615	25605	98.5	1.5	0-8

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Job No.: CTCE/BBMP/W.No.14/KRIDL/WMM/AIV/2014-15

25.09.2014

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	25.09.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	383	384	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	83	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	21.67	21.88	
	100* (W_2/W_1)%			21.81

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.14/KRIDL/WMM/S-T/2014-15 25.09.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of Work	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	25.09.2014

Result : Flakiness Index = **12.33%**

Elongation Index = **13.45%**

Result : Combined Flakiness & Elongation index **25.78%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.14/KRIDL/WMM/AL/2014-15

25.09.2014

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of Work : Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.

Reference : BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014

Date of Testing : 25.09.2014

Material : WMM

Sample Location : WMM Mix Plant

As per MORTH Table 400-11

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	23.00	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

Note:

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2. The results indicated above are based on the tests carried out on the samples received in the laboratory.
3. Any Query regarding the report must be reported within 30 days from the date of testing.

Civil-Tech Consultants & Engineers Bangalore

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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.14/KRIDL/CSR-9/616d/Bitumen/2014-15

06.10.2014

TEST REPORT

* CUSTOMER	:	**Asst. Executive Engineer**, T. Dasarahalli Sub Division, BBMP, Bangalore.
*AGENCY	:	**Technical Manager (West),** KRIDL, Bangalore.
*NAME OF THE WORK	:	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
*REFERENCE	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
*SAMPLE ID	:	Bitumen
SAMPLE RECEIVED ON	:	04.10.2014
DATE OF TESTING	:	06.10.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73-2006
1	Penetration at 25 ^{0}C, 100g, 5 Sec 1/10 mm	IS :1203 -1978 (RA-2009)	86	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	62.0	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	278	Min. 220

*Information is furnished by the Customer/Representative.

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Job No.: CTCE/BBMP/W.No.14/KRIDL/SDBC/Bit/2014-15 13.10.2014

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
REFERENCE	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
SAMPLE I/D	Roads in Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
DATE OF TESTING	13.10.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476	476.5
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	24	23.50
7. Bitumen content in %	4.80	4.70
8. Average	**4.75**	

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Job No.: CTCE/BBMP/W.No.14/KRIDL/SDBC/Bit/2014-15 13.10.2014

GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CUSTOMER	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Construction of Concrete Drain and Improvements to Roads at Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
REFERENCE	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 02.09.2014
SAMPLE I/D	Roads in Siddeshwara Badavane in Bagalagunte Ward No.14, BBMP, Bangalore.
DATE OF TESTING	13.10.2014

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	35.45	7.45	7.45	92.55	90-100
4.75	262.4	55.13	62.57	37.43	35-51
2.36	51.46	10.81	73.38	26.62	24-39
1.18	34.56	7.26	80.64	19.36	15-30
0.3	35.42	7.44	88.09	11.91	9-19
0.075	28.14	5.91	94.00	6.00	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	34.25	7.19	7.19	92.81	90-100
4.75	262.5	55.09	62.28	37.72	35-51
2.36	49.86	10.46	72.74	27.26	24-39
1.18	34.28	7.19	79.93	20.07	15-30
0.3	32.73	6.87	86.80	13.20	9-19
0.075	31.56	6.62	93.43	6.57	3-8

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